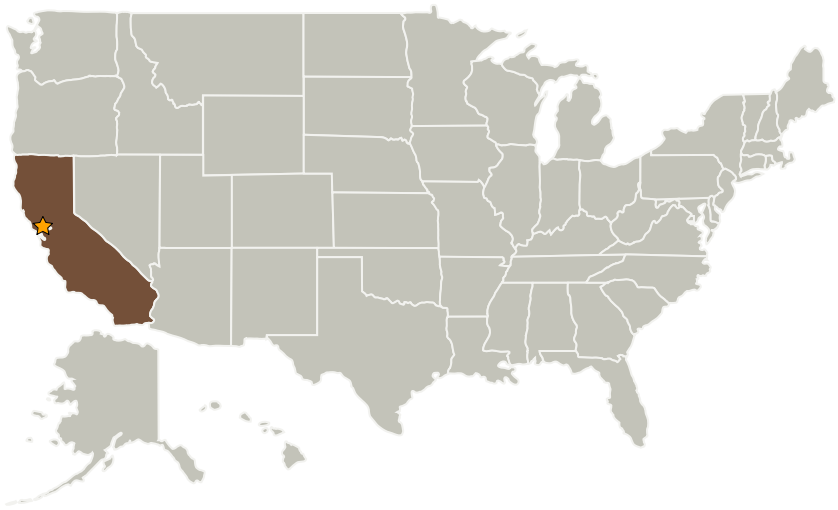
Lunar Navigator - A Miniature, Fully Autonomous, Lunar Navigation, Surveyor, and Range Finder System, Phase I

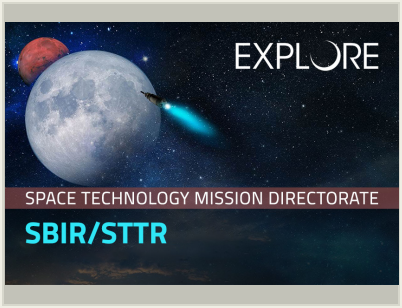
Completed Technology Project (2009 - 2009)

Project Introduction

Microcosm proposes to design and develop a fully autonomous Lunar Navigator based on our MicroMak miniature star sensor and a gravity gradiometer similar to one on a ship-board celestial navigation system designed by Microcosm for the Navy. The new sensor will provide surface navigation on the Moon or Mars with accuracies comparable to state-of-the-art precision celestial navigation systems on Earth. The system can rapidly determine its location anywhere on the Moon or Mars where a large portion of the sky is visible, day or night. With the unique three field-of-view star sensor design, the sensor can also be used to provide precise surveying of surrounding terrain and, in either of two modes, can provide passive range-finding to artificial or natural objects. The entire package will be less than 10 cm on a side, weigh less than 1 kg, draw less than 10 W of power, and work in a wide range of temperature and illumination conditions. Phase I will focus on the system requirements, a preliminary navigator design, and initial performance estimate. Phase II will focus on fabricating and testing a functioning prototype of the Lunar Navigator, including ground testing with real stars at night.

Primary U.S. Work Locations and Key Partners





Lunar Navigator - A Miniature, Fully Autonomous, Lunar Navigation, Surveyor, and Range Finder System, Phase I

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Lunar Navigator - A Miniature, Fully Autonomous, Lunar Navigation, Surveyor, and Range Finder System, Phase I

Completed Technology Project (2009 - 2009)

Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Microcosm, Inc.	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Hawthorne, California

Primary U.S. Work Locations
California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.1 Sensing and Perception
    - TX04.1.2 State Estimation